

DESCRIPTION OF LARVA AND NEW HOST PLANTS FOR *ANTHONOMUS RUBRICOSUS* BOHEMAN (COLEOPTERA: CURCULIONIDAE) IN ARGENTINA¹

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ABSTRACT: The main purposes of this paper are to describe the larva of *Anthonomus rubricosus* Boheman (Curculionidae: Anthonomini) and to provide new information on its host plants. The species is similar to *Anthonomus vestitus* Boheman, based on the presence of four epipharyngeal sensilla arranged in a single cluster and the labial palpus one-segmented. It differs by its smaller body size (about 2 mm), basal segment of maxillary palpus shorter than apical segment, and premental sclerite with posterior extension shorter than anteromedian extension. Teneral adults, larvae and a pupal exuvia of *A. rubricosus*, the latter along with a parasitoid (Pteromalidae), were found inside flowers of *Hibiscus rosasinensis* L. and fruits of *Pavonia* sp. (Malvaceae), in Misiones Province, Argentina.

KEYWORDS: *Anthonomus rubricosus*, Coleoptera, Curculionidae, larva, host plants, Argentina.

As a consequence of a survey of alternative host plants of *Anthonomus grandis* Boheman in Misiones Province, Argentina, we have found weevil larvae inside flowers, flower buds and fruits of two species of Malvaceae. Based on association with teneral adult specimens, some of these larvae were assigned to *Anthonomus rubricosus* Boheman, a species recorded as harmful to cotton in Argentina and Brazil (Bosq 1943, Silva *et al.* 1968, Lanteri *et al.* 2002). The main purposes of this paper are to describe the larva of *Anthonomus rubricosus* and to provide new information on its host plants.

METHODS

Field work to collect Malvaceae that would serve as alternate hosts of weevils harmful to cotton, was done in Misiones Province, Departments of Iguazú, Eldorado, San Ignacio and San Javier, along the Paraná and Uruguay rivers, during February 2001. Several samples of the following species were examined: *Malvastrum coromandelianum* (L.) Garcke, *Pavonia sepium* St. Hil., *Pavonia* sp., *Pseudabutilon* sp., *Sida rhombifolia* L., *Sida spinosa* L., *Hibiscus mutabilis* L., *H. rosasinensis* L., *H. schizopetalus* Hook.f., *H. syriacus* L. and *Hibiscus* sp. Samples of reproductive structures of these plants were dissected under a stereoscopic microscope to look for weevil specimens inside.

Techniques for preservation, dissection and illustration of the larva, follow May (1977, 1979, 1993). The terminology used in the description is according to Marvaldi (1999). Drawings were done with a camera lucida adapted to a compound microscope. Adult voucher specimens and larvae (slide mounted) are

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deposited at the entomological collection of the Museo de La Plata (MLP). Teneral adults taken from reproductive structures of Malvaceae, along with larvae, were identified by comparison with adult specimens of *A. rubricosus* housed at the MLP collection.

RESULTS

Several weevil larvae were found inside reproductive structures of two species of Malvaceae from Misiones Province. Larvae about 5 mm long, collected inside fruits of *Malvastrum coromandelianum* and *Pseudabutilon* sp., in Eldorado and San Javier Departments, were assigned to Curculioninae in the broad sense (Alonso-Zarazaga & Lyal 1999) but in the absence of associated adults it was not possible to identify them further. They do not belong to *Anthonomus grandis*, neither can they be assigned to the tribe Anthonomini, since they have a frontal seta 2 present, six epipharyngeal sensilla arranged in two clusters of three sensilla in each, and a terminal anus.

Small larvae (about 2 mm long) along with teneral adults, found inside flowers of *Hibiscus rosasinensis* L. and fruits of *Pavonia* sp. in Iguazú Department, were identified as *Anthonomus rubricosus* Boheman (Fig. 1).

A partially destroyed exuvia of one pupa was collected along with one female of Pteromalidae, Chalcidoidea, inside fruits of *Pavonia* sp., in Teyú Cuaré, San Ignacio Department, 15-02-2001. This exuvia apparently belongs to *A. rubricosus*, and we believe that the pupa was killed by the parasitoid.

Taxonomic information on *Anthonomus rubricosus* Boheman

Anthonomus rubricosus Boheman 1859 (= *A. campinas* Marshall 1938) is probably related to *A. vestitus* Boheman, distributed in Perú and Ecuador, and to other members of the genus assigned to the *squamosus* group of Dietz, such as *A. bisimatus* Burke & Cross, from Colombia, and *A. testaceosquamosus* Linell, from southern Texas and northeastern Mexico (Burke & Cross 1966, Ahmad & Burke 1972). All these species have Malvaceae as hosts. *Anthonomus grandis* and other members of the *grandis* group also have several Malvaceae as hosts (Burke & Cate 1983, Burke *et al.* 1984; Jones & Burke 1997), but are probably less closely related to *A. rubricosus* (Clark pers. com.). A redescription of *A. rubricosus* based on adult characters is needed, but we consider that it would be better to do that in the context of a taxonomic revision of the genus *Anthonomus*.

Geographic range. Argentina, Bolivia and Brazil. Within Argentina, *A. rubricosus* is distributed throughout the provinces of Buenos Aires, Chaco, Corrientes, Entre Ríos, Misiones, Salta, Santiago del Estero and Tucumán.

Host plants. Weevils of the tribe Anthonomini are first grade oligophagous, regarding host selection. The hosts of each of the weevil species are confined to a single plant family and sometimes to one plant genus (Burke 1976). The knowledge of plant associations is very important to clarify the phylogenetic relationships within the tribe and to predict which species could be harmful for crops (Lanteri *et al.* 2002).



Fig. 1. Teneral adult of *Anthonomus rubricosus* inside a flower bud of *Hibiscus rosasinensis* (Malvaceae).

Previously, the known hosts for *A. rubricosus* in Argentina were *Sphaeralcea* sp. and *Gossypium hirsutum* L. (Lanteri *et al.* 2002). Herein we add *Pavonia* sp. and *Hibiscus rosasinensis* L. This weevil has caused severe damage to young cotton plants in Chaco, Argentina (Bosq 1943, Denier 1939), and São Paulo, Brazil (Silva *et al.* 1968).

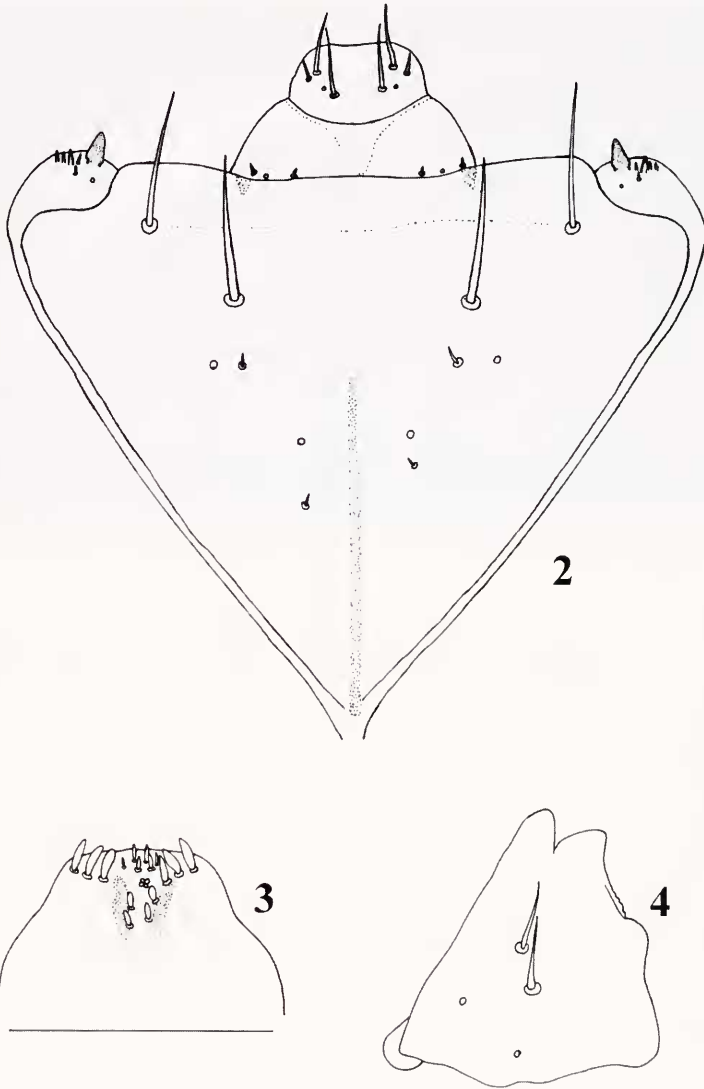
Species related to *A. rubricosus* and their known host-plants are as follows:

1) *Anthonomus vestitus*: *Gossypium raimondii* Ulbr., *Gossypium hirsutum* L., *Cienfuegosia heterophylla* Garcke, *Hibiscus rosasinensis* L., *Althea rosea* (L.) Cav., and *Sida paniculata* L.; 2) *Anthonomus bisinuatus*: *Hibiscus* sp. and *Gossypium hirsutum* L.; 3) *Anthonomus testaceosquamosus*: *Hibiscus*, *Sida*, *Abutilon*, and *Pseudabutilon*, but this species does not attack cotton (Burke & Cross 1966, Ahmad & Burke 1972).

Material examined. ARGENTINA: Corrientes: 08-1934 (1 MLP); San Roque. 02-1920 (7 MLP); Colonia San Antonio, Dep. San Miguel, 2002, 10 ex. collected on pheromone trap close to cotton fields. Entre Ríos: Concordia, 02- 1996 (3 MLP). Misiones: Pindapoy, 10-1935 (1 MLP); Loreto, 04-1996 (7 MLP); Puerto Libertad, Dep. Iguazú, 12-02-2001, 1 teneral adult, in flowers of *Hibiscus rosasinensis* L.; Destacamento Ecolacustre Lago Uruguay, 12-02-2001, 1 teneral adult along with larvae, in fruits of *Pavonia* sp. Chaco: Resistencia (1 MLP). Salta: Orán, 09-1939 (1 MLP).

Mature larva of *Anthonomus rubricosus*

Body length 1.5-2.0 mm. Head width 0.5 mm. Head capsule subcircular; stemmata (ocelli) pigmented before clearing with KOH, anterior stemma black, conspicuous, with convex cornea, posterior stemma hardly distinct, as small brown spot. Antenna (Fig. 2) with basal article bearing elongate-conical sensorium and six minute sensorial structures, one rounded and five elongate (one distinctly longer than others). Endocarina (Fig. 2) about 2/3 as long as frons. Frontal seta 1 and 3 very short, setae 4 and 5 long, subequal (Fig. 2). Dorsal epicranial seta 1 slightly longer than seta 2, setae 3 and



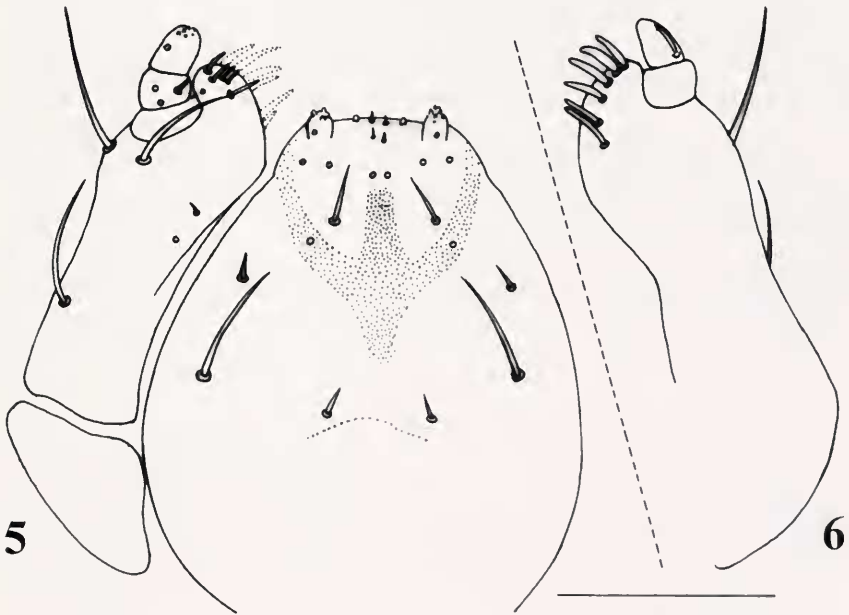
Figs. 2-4. Larva of *Anthonomus rubricosus*. 2) Clypeus, labrum and frontal area of head, dorsal; 3) epipharynx; 4) mandible. Scales = 0.1 mm.

5 longer than the others, seta 4 minute; dorsal epicranial seta 3 located closer to frontal line than seta 1. Lateral epicranial seta 1 about $1/2$ as long as 2. Clypeal setae short, close to anterior margin of frons (Fig. 2). Labral setae 1 and 2 subequal in length, seta 3 short, less than $1/3$ as long as seta 2 (Fig. 2). Epipharynx (Fig. 3) with three anterolateral setae on each side; four epipharyngeal sensilla (sensory pores) arranged in single median cluster; labral rods subparallel, slightly converging posteriorly, not reaching base of clypeus. Mandibular setae 1 and 2 subequal, longitudinally placed, well separated at base (Fig. 4). Maxilla (Figs. 5, 6) with six dorsal and five ventral malar setae; maxillary

palpus with basal segment shorter than apical. Labium (Fig. 5) with one-segmented palpus; premental sclerite with posterior extension shorter than anterior; postmental setae 1 and 3 short, subequal; seta 2 more than four times longer than others. Thoracic and abdominal spiracles with airtubes seven-annulated. Prothorax with two pleural setae. Meso- and metathorax with one epipleural and one pleural seta; postdorsal setae 1 and 3 longer than setae 2 and 4. Abdominal segment IX with pleural areas not projecting and with short sternal setae.

Materials examined. Argentina, Misiones, Dto. Iguazú, Destacamento Ecolacustre Lago Uruguái, 12-02-2001, in fruits of *Pavonia* sp., 2 ex. Larvae were identified based on their association with adult specimens found on the same hosts and inside the same reproductive structures.

Comparative notes. Based on larval characters, *A. rubricosus* is close to *A. vestitus*. Both species have frontal setae 1 and 3 very short, four epipharyngeal sensilla arranged in a single cluster and the labial palpus one-segmented. In the key of Ahmad and Burke (1972), they key out together, except for their different sizes (the former species is about 2 mm and the latter, 4.1 - 5.5 mm). They also differ in the characters of the maxillary palpus and premental sclerite. In *A. rubricosus* the basal segment of the maxillary palpus is shorter than the apical segment, and the posterior extension of the premental sclerite is shorter than the anteromedian extension. In *A. vestitus*, the basal segment of the maxillary palpus is slightly longer than the apical segment, and the posterior extension of the premental sclerite is longer than the anteromedian extension.



Figs. 5-6. Larva of *Anthonomus rubricosus*. 5) Maxilla and labium, ventral; 6) maxilla, dorsal. Scales = 0.1 mm.

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